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To help quadriplegics and other severely disabled achieve vocational placement and confront the catastrophic impact of quadriplegia on bodily function (as detailed in the report), a rehabilitation team provided medical, various special, and vocational rehabilitation services. The 100 clients (59% men, 79% less than 45 years and 62% between 20 and 39) were evaluated for physical capacities and job-task performance. Of the 100, 62 received and completed intensive training services, including vocational adjustment training, psychosocial services, and group counseling. Various job placement and promotion techniques were utilized. Of these 62, 25 were quadriplegics, 23 of whom were placed in gainful employment. Of the remaining 37 who had various degrees of severe disability, 30 were placed. Also part of the project was a mail survey made to determine the current employment experience of the quadriplegic. Of 355 persons contacted, 177 responded, of whom 69 were employed and 18 were attending college. Further descriptive data, six case studies, four recommendations, and 12 references are included. (JD)

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FINAL REPORT TO THE

VOCATIONAL REHABILITATION ADMINISTRATION
UNITED STATES DEPARTMENT OF HEALTH, EDUCATION AND WELFARE

SPECIALIZED PLACEMENT OF QUADRIPLEGICS AND OTHER SEVERELY DISABLED

RD 509

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FINAL REPORT

SPECIALIZED PLACEMENT OF QUADRIPLEGICS AND OTHER SEVERELY DISABLED

Project RD 509

December 1, 1959 to November 30, 1962

Vocational Rehabilitation Administration
Department of Health, Education and Welfare
Washington, D.C.

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PART I. DEVELOPMENT AND DESCRIPTION OF THE PROJECT

A. INTRODUCTION

This is the final report of a demonstration project carried out at the Institute of Physical Medicine and Rehabilitation, (IPMR) New York University Medical Center, between December 1, 1959, and November 30, 1962. When the project was originally formulated it was seen as focusing primarily on the exploration of the problems of vocational placement of the quadriplegic and other severely impaired neuromuscular disability groups who were considered unfeasible by current standards of vocational and placement agencies. It was hoped that through individualized, intensive and timeconsuming placement services (that hitherto were not available to this group) a body of experience could be developed that would clarify and define barriers to placement, and that we could evolve techniques and methods for overcoming these barriers.

The project grew out of our increasing experience with quadriplegic patients and our conviction that many previously considered unemployable or unfeasible for vocational rehabilitation services could, with sufficient time, skill and know-how, be successfully rehabilitated. From its establishment in 1948 until 1959, the Institute serviced about 350 quadriplegic patients. Quadriplegia, with its catastrophic impact on bodily function, can be overwhelming not only to the patient, but also to the rehabilitation counselor. With increased understanding of the quadriplegic, his limitations and his potential, the counselor's helplessness and anxiety may be reduced and his capacity for constructive help increased. We hope, in this report, to provide a body of information and experience that will be useful to rehabilitation counselors and placement personnel responsible for servicing the quadriplegic client.

B. THE PROBLEM

Due to rapid improvement in the quality of rehabilitation services and to the increasing availability of these services, many persons once considered unfeasible for vocational rehabilitation are now accepted and successfully rehabilitated. Quadriplegia has only recently become a problem to the rehabilitation worker. Prior to recent advances in medicine and medical management, the quadriplegic did not long survive the spinal injury responsible for his disability. Today, persons suffering from quadriplegia are seen as the most difficult candidates from medical, social and vocational rehabilitation perspectives and are frequently considered unfeasible for vocational rehabilitation.

There are no reliable estimates of the number of quadriplegics in the United States. The total number of paraplegics and quadriplegics has been variously estimated from 83,000 (1) to 125,000 (2). It is not possible to confirm these estimates nor to estimate what percentage of these groups might be quadriplegics. The Veterans Administration reported in 1957 (press release) that there were more than 450 quadriplegics in seven Veterans Administration Hospitals at that time. At the Institute of Physical Medicine and Rehabilitation, New York University Medical Center, there has been a steady increase in the number of traumatic quadriplegic patients admitted, rising from 33 in 1955 to over 60 in 1962.

It is expected that the number of quadriplegics who will become potential rehabilitation candidates will grow, due to: life-saving advances in the acute management; improvement in long-term management; general population increase, and increased exposure to the possibilities of accidents as a result of the greater use of automobiles and of growing participation in potentially hazardous activities such as skiing, water sports, and trampolines. Also, in recent years, much younger quadriplegics are being admitted for rehabilitation services (3), with an increase in the number of patients below the age of 20.

Despite the variation in estimates and the paucity of statistics, it would appear that the number of quadriplegics is growing and will constitute a significant group in need of rehabilitation services.

As the result of IPMR's increasing experience with quadriplegics, we have developed a greater understanding of this group and have felt growing optimism about their vocational potential. Concomitantly we became more aware of the lack of vocational rehabilitation and placement services for the quadriplegic. Patients discharged from IPMR whom we felt had vocational potential were sometimes rejected for service as unfeasible; the available services did not have the experience and know-how required to deal successfully with the quadriplegic's complex problems, or the services could not provide the large amount of time and intensive effort essential for possible success in achieving a vocational goal and successful rehabilitation.

C. OBJECTIVES

Our project activities were focused on four primary objectives:

1. To gather systematic information on the vocational experiences of the quadriplegic. Very little information is available on the vocational experiences of the quadriplegic. It was felt that a survey of agencies serving the severely disabled should be made in order to bring to light any body of experiences that has not been published. In addition, a survey of former quadriplegic patients at the Institute was made to determine the vocational and placement experiences of a substantial group—392 individuals.

2. Our second objective was to provide direct services to a group of quadriplegics and other severely disabled. Through a placement counselor and a comprehensive array of other rehabilitation services, we sought to meet the total needs of each individual in an effort to make him employable. We sought to provide services that were as comprehensive, intensive and flexible as the individual required.

3. Thirdly, through job promotion, a specialized placement committee and employer education, we attempted to make the employable person placeable.

4. Finally, we sought to develop a body of experience through our surveys and our direct services that might serve as a basis for more effective vocational rehabilitation services to the quadriplegic and other severely disabled.

D. STRUCTURE AND SETTING

The project was based at the Institute of Physical Medicine and Rehabilitation, New York University Medical Center. This is a private, comprehensive medially oriented rehabilitation center with about 100 adult inpatient beds and a large outpatient case load. The Institute seeks to provide staff services to meet the total needs of its patients. Besides the medical personnel and the physical and occupational therapists, the staff includes psychiatrists, psychologists, social workers, vocational rehabilitation counselors, therapeutic recreation workers, speech therapists, and a prosthetics and orthotics department.

The Vocational Services Department provides an intensive vocational service. Through counseling, testing, pre-vocational evaluation and sometimes through job tryouts, the patients have an opportunity to deal with their vocational problems and to try to formulate a vocational plan. Every effort is made to involve the state rehabilitation agencies in cooperative planning. The staff vocational counselors have been responsible for helping patients find employment. This service, however, could seldom be continued to patients who had been medically discharged, since the counselors' time was demanded by current patients. This group was usually referred to community vocational placement resources.

A substantial number of discharged patients with severe disability and vocational handicaps were unable to obtain adequate services because of limitations in community services. It was felt that there was a need for a full time placement counselor and to extend service to those patients who had been discharged in previous years and still needed service.

The present project provided such a full-time placement counselor. He was a member of the Vocational Services Department, responsible to the Chief of Vocational Services, and functioned as a member of the rehabilitation team together with all the other disciplines. His responsibilities and services included the following:

1. To provide a comprehensive and intensive placement service including evaluation of employability, placement counseling, job referral and job counseling.

2. To develop a job promotion program.

3. To serve as a consultant and resource person to the IPMR staff in developing suitable and realistic vocational goals in terms of disability and of labor market needs.

4. To collect data on the experiences of the employed quadriplegic.

The placement project had available to it the total resources of IPMR as well as the Committee for the Specialized Placement of the Handicapped. This committee, composed of prominent business and professional people, had already been functioning at the Institute for several years. It was ready to serve the project not only as a source for direct placement but also for solution of general problems related to the placement of the handicapped.

PART II. MEDICAL ASPECTS OF QUADRIPLEGIA*

The medical advances of the past two or three decades have saved the lives of many patients who formerly would have died. As a result of their trauma or disease many of these patients are left with disabilities of varying severity. Consequently, the medical profession and its allies are faced with the responsibility of helping these patients to live with their disabilities.

One of the most severe of these disabilities is quadriplegia. By definition, quadriplegia is paralysis of all four extremities. Such paralysis can result from trauma or disease of the brain, of the spinal cord, of peripheral nerves or of the muscles. Quadriplegia from any of these causes is extremely disabling. There is, however, some variation in the clinical features, the prognosis and the extent of disability among these variously caused conditions of quadriplegia.

The use of the term "quadriplegia" without modification has typically come to mean in many rehabilitation circles a patient who has become quadriplegic as the result of trauma to the cervical spinal cord. It is traumatic quadriplegia that will be described herein. Many of the problems of rehabilitation encountered in traumatic quadriplegia exist in quadriplegia from other causes, but there are distinct differences. For example, in quadriplegia resulting from disease of the brain stem the disability is usually complicated by considerable spasticity and incoordination and frequently by partial or even total speech impairment. In poliomyelitic quadriplegia, which may entail severe loss of motor power, including respiratory motor loss, the problems of sensory loss and loss of bowel and bladder function do not exist.

Automobile accidents lead the list of causes of traumatic quadriplegia. Diving accidents and falls are also high on the list. Most of the patients with traumatic quadriplegia seen at the Institute of Physical Medicine and Rehabilitation are in a younger group; the majority are in their teens or twenties.

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*Part II was written by Nancy C. Kester, M.D., Academic Career Fellow, Institute of Physical Medicine and Rehabilitation, New York University Medical Center.

The extent of clinical involvement and the prognosis depend upon several factors. The most significant of these are the degree of damage to the cord and the level of damage. When the spinal cord is subjected to trauma, the damage may be complete or partial. The complete or partial damage may be transient or permanent. In most cases, damage to the spinal cord itself is the result of fracture and dislocation of one or more cervical vertebrae with compression of the cord. In rare instances the cord may be damaged without demonstrable alteration of vertebral architecture. In other instances a ruptured intervertebral disc without disruption of the vertebrae themselves may be responsible for damage to the spinal cord. The fracture-dislocation may completely sever the spinal cord. In this case, if a laminectomy is performed, inspection of the cord reveals the complete severance, which precludes any return of function below the level of severance. In other instances the cord is only contused to varying degrees. Not infrequently inspection of the cord at laminectomy reveals no, or slight, gross damage to the cord even in the face of complete quadriplegia. There is no correlation between the gross appearance of the cord and the degree of neurological deficit.

The most frequent levels of cervical vertebral fracture-dislocation are the fifth and sixth and the sixth and seventh cervical vertebrae. Damage to the cord at the C4 level or higher is usually incompatible with life, since at that level the diaphragm, in addition to the intercostal muscles, becomes denervated. It is common practice to refer to a quadriplegic patient as a "C5 quad" or a "C6 quad," as the case may be. This label may be confusing unless distinction is made as to whether the level refers to the level of vertebral disruption or of actual cord damage. The two are not the same. Because of the different rates of growth of the cord and spine, the cord segments are displaced upward from their corresponding vertebrae, the discrepancy becoming greater as one passes downward along the cord. For example, C6 segment of the cord is approximately at the level of the lower portion of C5 vertebrae; C8 segment of the cord is at the level of the lower portion of C6 and upper portion of C7 vertebrae. The exact level of spinal cord involvement is a vital determinant of the patient's functional prognosis.

Clinically, the patient with traumatic quadriplegia presents a number of major medical problems. The primary responsibility of dealing with these problems falls to the physician. However, it is also the responsibility of all members of the rehabilitation team, including the vocational counselor, to be aware of these problems and their influence upon the patient's program of rehabilitation.

In the presence of complete disruption of the spinal cord all voluntary motor power and all sensation is lost below the level of the lesion. In some cases the disruption of the spinal cord may be only partial. In these instances there is some sensory preservation and, in some cases, motor preservation. The degree of preservation varies, of course, with the extent of damage to the cord. It may be spotty throughout the body or it may have a unilateral distribution.

One of the most serious problems in the quadriplegic patient is loss of bowel and bladder control. In the majority of patients control or, more correctly stated, regulation of bowel function can be re-established by means of persistent, strictly disciplined training. Usually, failure to re-establish bowel control is due to lack of perseverance by the physician, nurse or patient. The urinary tract presents a more complicated problem. Injury to the spinal cord is followed by a state of spinal shock, which may persist for several weeks or months. During this period the bladder remains atonic or hypotonic and requires continuous drainage by catheter in order to empty the bladder completely to prevent overdistention and irreversible stretching of the bladder wall. After the period of spinal shock the bladder regains tonicity and the potential to be trained as an automatic bladder. Close urological supervision is indicated during this time, and, indeed, for the rest of the patient's life. Urinary infections and calculi are frequent problems in the quadriplegic patient. These problems must be anticipated and, if possible, prevented; or at least, detected and treated early in order to minimize the threat of permanent renal damage. Adequate emptying of the bladder must be established in order to prevent reflux of urine into the ureters with the consequent danger of hydronephrosis and impairment of renal function. These complications - infections, calculi and ureteral reflux - are hazards to the actual life of the patient. The elimination of these complications, alone, does not solve the patient's urinary problem. Every effort must be made to re-establish continence of the bladder.

Failure to do so may make the patient's social and vocational rehabilitation impossible. In many patients this continence can be re-established by persistent training of the bladder. In some cases establishment of an automatic bladder may require surgical resection of the bladder neck. In males an external collecting device may be necessary to guard against leakage of urine; unfortunately, attempts to use external collecting devices have not been satisfactory in females.

The importance of the urinary tract can hardly be overstressed. Quadriplegic patients must realize and accept the fact that they should have a complete urological evaluation at least every year.

A serious complication which interferes with the rehabilitation of a quadriplegic patient is decubitus ulcers. They are usually the result of poor skin hygiene and/or excessive pressure in denervated tissue, frequently in the presence of anemia and hypoproteinemia. The best weapon against these is prevention. With proper skin care and frequent changing of position to prevent prolonged pressure, most patients can avoid the complication of decubitus ulcers. However, there are certain patients in whom, for reasons not fully defined, decubitus ulcers develop repeatedly and persistently in spite of the usually adequate preventive measures. The presence of decubitus ulcers seriously interferes with the total rehabilitation of the patient. They necessitate long periods, even up to months, of inactivity in a position to avoid pressure on the site of the ulcer. Decubitus ulcers usually occur over bony prominences. The most common sites are over the ischial tuberosities, the sacrum, the greater femoral trochanters and the heels. In order to avoid pressure over these areas it is usually necessary to keep the patient with decubitus ulcers in a prone or side-lying position until the ulcers are healed. When the conservative measures of prevention of pressure, strict hygiene of the skin, and improvement of general nutrition fail to heal the ulcers, plastic surgery becomes necessary. Post-operatively it is again necessary to impose long periods of inactivity upon the patient if the plastic repair of the ulcer is to be successful.

Another problem frequently encountered in quadriplegia is spasticity, a state of hypertonicity of muscles. When severe, spasticity can produce involuntary muscular contractions, either sustained or repetitive, which seriously interfere with rehabilitation of the patient. Spasticity is the result of damage to the upper motor neurons and does not occur with lesions of lower motor neurons. In lesions of the cervical cord it is usually the lower motor neuron that is involved in the case of the upper extremities and the upper motor neuron in the case of the trunk and lower extremities. Consequently, spasticity is usually confined to the trunk and lower extremities, but occasionally may be present also in the upper extremities. Spasticity may be mild or even, to all practical purposes, absent in many patients, but in a significant number of patients it is severe enough to constitute a serious problem. When extremely severe, the involuntary muscular contractions resulting from spasticity may even be forceful enough to throw the patient out of his wheelchair, either by forward flexion or by backward extensor thrust of the trunk and lower extremities. Spasticity may inhibit or counteract the voluntary use of muscles of functional strength. Decubitus ulcers may be precipitated or aggravated by the dragging, or friction-producing, effect on the skin resulting from involuntary muscular contraction. Spasticity of the peripheral muscles is usually accompanied by spasticity of the bladder, which may prevent the establishment of a satisfactory automatic bladder. If the trunk muscles are sufficiently spastic, an already reduced respiratory capacity may be further impaired.

The management of spasticity represents one of the most difficult therapeutic problems in rehabilitation. Many drugs have been administered to combat spasticity, but only one or two of these have proved to be useful, and then only in some patients. In cases of spasticity severe enough to interfere with the patient's rehabilitation, it is often necessary to relieve the spasticity by destructive neurosurgical procedures. The two procedures used most successfully at this institution are alcohol wash of the spinal cord (the injection of alcohol into the spinal fluid bathing the cord below the level of injury) and cordectomy (removal of the spinal cord below the level of injury). The use of these procedures is restricted to patients who have no motor power below the level of injury for at least one year after injury.

Another problem which may complicate a patient's rehabilitation is the development of contractures, i.e. the loss of mobility of joints as a result of shortening or tightening of muscles and other soft tissues. The presence of contractures may limit, or even prohibit, the use of muscles of functional strength; they also may interfere with the patient's self-care or his care by others; and, thirdly, they are undesirable cosmetically. Contractures develop as a result of the patient's inability to move the body segments through their full range of motion. It is far easier to prevent their development than to eliminate contractures once they have occurred.

Only fairly recently have cardiac and pulmonary functions in the quadriplegic begun to receive the attention that they warrant. With loss of the function of the intercostal and abdominal muscles, the patient's respiratory capacity is significantly diminished. It may be quite adequate for the patient at rest, but inadequate with increased activity or with the increased respiratory demands of fever. With the diminished exchange of air and the inability to cough to aid in the removal of secretions, quadriplegic patients are also more susceptible to respiratory infections. Good care of the quadriplegic patient should include careful, detailed evaluation of pulmonary function and correlation of the data thus obtained with the demands of the physical activities to be imposed upon the patient. Complications from respiratory infections should be anticipated and treated promptly and vigorously. As indicated earlier, their exact nature and significance to the patient have not been fully defined, but cardiac changes may occur with time and should be detected and evaluated.

A consideration of the prognosis of a quadriplegic patient must be threefold. First, there is the prognosis for life, itself. The advent of improved knowledge and care of quadriplegic patients is too recent to provide actual statistics on survival time of quadriplegic patients. Once the patient survives the acute stage following injury, his chances for long time survival appear to be quite good. The main threats to life are renal damage from recurrent urinary tract infections and/or formation of calculi or from mechanical reflux or urine from the bladder, respiratory infections in the presence of diminished pulmonary function, and infection or general debilitation from persistent decubitus ulcers. Impaired cardiac function appears also to be a possible life-threatening factor. As yet there is insufficient long-term follow-up of quadriplegic patients to establish the extent to which impairment of cardiac function plays a role in longevity of quadriplegic patients. Certainly there are some patients, who from the very onset of their quadriplegia do poorly, i.e. have recurrent life threatening problems. The prognosis of these patients can be expected to be poor.

A second category of prognosis is that for return of function. This one, of course, is of utmost concern to the patient. There are no well established rules about recovery of function. To be sure, the patient with incomplete motor paralysis has a better prognosis for recovery of motor function than the patient with complete motor paralysis. In a recent study Suwanwela, Alexander and Davis (4) found that patients in whom complete motor and sensory loss lasted longer than 24 hours after trauma had no significant recovery of motor function. Patients with some sensory preservation below the level of injury or with some return to sensory function within the first 24 hours after trauma may have significant recovery of motor function. In those patients who had some recovery, motor function began to return in from six days to five months after injury and continued to improve slowly over a period of years.

A third category of prognosis is that of functional performance. Any vocational or other long range planning for the patient must take this prognosis into consideration. The level of spinal cord involvement is of primary importance in making this prognosis. In order to avoid confusion, all further references to level of quadriplegia indicate cord segment level, not level of vertebral injury. Designation of a specific level indicates that function is absent in that segment of cord as well as all segments below it. With rare exception the patient with spinal cord involvement as high as the upper dorsal level can locomote only by wheelchair. A few patients, usually younger, previously well-coordinated individuals, can learn to ambulate with braces and crutches. Usually, however, even when ambulation is achieved by these patients, the energy costs are so great that it is far more practical for them to use a wheelchair. Usually patients with cord involvement below the level of C5 can propel their own wheelchair. At C5 or higher level they lack sufficient shoulder control to propel their own chair, but usually can manage a motor-driven chair.

A C6 quadriplegic usually has, or can develop, fair control of the shoulder, has a functional degree of flexion of the elbow, but no extension, has some supination of the forearm but no pronation, and has no voluntary power of the wrist or hand. With hand splints and other devices to hold utensils and tools and with proper training of muscles and the use of these devices, it is possible for this patient to feed himself, turn pages of a book, write, type, perform some of his grooming. He may be able to offer some assistance, but will be dependent on others for the majority of his dressing, for transfers between wheelchair and bed, into an automobile, for placing objects within his reach, and probably for putting on some of his splints and self-help devices.

A C7 quadriplegic has good shoulder motion, good flexion but no extension of the elbow, good supination but poor pronation of the forearm, extension of functional strength but no flexion of the wrist, and no motion of the fingers and thumb. This patient will be able to perform the same functions as the C6 quadriplegic, but with greater strength and better coordination. The presence of voluntary wrist extension, if strong enough, significantly enhances the patient's grasp by permitting the utilization of a dynamic hand splint which converts extension of the wrist to grasp of the hand.

A C8 quadriplegic has strong power of all muscles of the upper extremities down to and including the wrists except for some weakness of the triceps. The triceps, however, is strong enough to permit functional extension of the elbow. The long flexors and extensors of the fingers and the long flexor, extensors and abductor of the thumb have good strength, thus giving the hand fairly functional grasp. The intrinsic muscles of the hand are paralyzed. This patient usually needs no splints or other self-help devices and is almost totally independent in most activities. By virtue of his strong upper extremities and a good latissimus dorsi bilaterally he should be able to execute transfers to and from his wheelchair, including into and out of an automobile, independently.

The preceding paragraphs have presented, rather summarily, the major medical problems to be dealt with in the rehabilitation of the quadriplegic patient. Consideration should be given now to how rehabilitation of the quadriplegic patient is accomplished and what the roles of the various members of the rehabilitation team are. Ideally, the physiatrist is given the opportunity to follow the patient early, even during his phase of acute care. During this stage, of course, the primary concern is the life of the patient and the care and protection of the cervical injury, itself. Physiatric measures are limited to proper positioning and passive exercises to maintain normal ranges of motion, proper skin care, and, perhaps, early muscle re-education. In many cases, there is no physiatrist available in the acute hospital, and the patient is not seen by a physiatrist until he is transferred to a rehabilitation center. In some cases the patient is transferred early and may still be in cervical traction on a Stryker frame. More typically, the patient has progressed beyond this stage when he arrives at the rehabilitation center. A major concern for at least the first six months after injury is protection of the cervical spine to prevent further trauma to the spinal cord and to allow healing of the cervical vertebrae. To this effect, the use of a rigid cervical collar to stabilize the cervical spine is recommended for six months, or even longer in some cases if circumstances warrant it.

As soon as the patient's general condition permits and adequate protection is provided for the cervical spine, the patient is placed on a tilt table once or twice daily. By slowly increasing the angle of the table and the length of time for which the patient remains tilted, his body, particularly his cardio-vascular system, gradually becomes re-accustomed to an upright position. This tilt table routine is also desirable for its psychological effect and for whatever benefit, if any, it may have in decreasing calcium loss from the long bones of the lower extremities.

A vital person in the patient's program is the rehabilitation nurse. She must be well versed in the measures necessary for the protection of the cervical spine, in proper skin hygiene, in proper positioning and frequent turning, in management of catheters and, later, in bowel and bladder training and in activities of daily living.

The physical therapist plays a major role in the rehabilitation of a quadriplegic. Early, after a careful evaluation of muscle strength and range of motion of joints, the physical therapist begins passive exercises to maintain or restore range of motion and, also, exercises for muscle re-education. Later, the therapist works with the patient to improve his sitting balance and stability of his paralyzed trunk. When muscles show sufficient strength, the therapist increases the vigor of the exercise program to include resistive exercises to further strengthen muscles, and exercises to improve coordination.

When the patient is able to sit for an adequate period of time and when there is sufficient strength in the upper extremities, the occupational therapist enters the picture. Occupational therapy offers functional activities designed to increase the strength of specific muscles or groups of muscles, to improve coordination and to increase specific skills, according to the patient's needs.

Closely allied to occupational therapy is the field of orthotics, which offers a number of splints and self-help devices to improve function of the upper extremities in the quadriplegic patient. As indicated above in consideration of the functional prognosis in quadriplegia, the shoulder and elbow, even with higher levels of cervical injury, usually have sufficient preservation of motor power to be functional. The hand, however, does not. The hand is the most highly complex component of the entire musculo-skeletal system and, therefore, the most difficult to duplicate or substitute for with mechanical devices. Its functions of grasp and pinch are most sorely missed. A number of splints and devices have been designed which do offer substitution to a useful degree. These range from a simple loop of elastic and leather which encompasses the hand and holds a fork or spoon, allowing the patient with a paralyzed hand to feed himself, to a complicated custom-made dynamic hand splint powered by a carbon dioxide artificial muscle which provides a paralyzed hand with voluntary grasp and release.

PART III. SURVEY DATA ON THE VOCATIONAL REHABILITATION OF QUADRIPLEGICS

A. INTRODUCTION

In 1957 the Veterans Administration published the first major study of the employment experiences of paraplegics (5). It was seen as a source of inspiration not only to rehabilitation workers but also to the handicapped themselves. It was described as an inspiring document of the comeback made by American paraplegic veterans. "...a vivid demonstration of the resilience of man, of his tremendous ability to adapt his life to the limitations of a severe physical handicap....a document of hope and courage."

Among the 466 cases of employed veterans reported in the Veterans Administration survey there were about 25 quadriplegics; the others were paraplegics. Figures on the employment of quadriplegics are rare: a 1955 survey by Bors (6) showed only eight per cent gainfully employed. Frost's study (7) indicated that 28 per cent of his group were employed. This was in sharp contrast to paraplegics whose employment rate is perhaps 60 to 70 per cent (8).

At the onset of the project it was felt that an attempt should be made to find out as much as possible about the current employment experiences of the quadriplegic, since very little information was available in the literature. The documenting of successful experiences could, we felt, provide not only hope and inspiration but also concrete information that could be of great importance in working more effectively with a severe disability unfamiliar to most rehabilitation workers. It was important to know such things as: the kinds of jobs at which quadriplegics had been successful; the preparation required for these jobs and how it was obtained; how the jobs themselves were obtained; the nature of adaptations required in the work environment; means of getting to and from work; remuneration; opportunity for advancement, and job satisfaction. The Veterans Administration report points out several significant uses for this type of information:

1. The rehabilitation worker can ordinarily utilize information about the employment experience of others who are similarly severely disabled. When an individual fears that

his disability may be an insurmountable obstacle in a particular kind of work suitable to his residual abilities, he can be reassured by the example of others who are similarly disabled and are actually employed in that kind of work.

2. When the problem is to help an individual find a suitable vocational outlet, a carefully organized presentation of the experiences of other people with the same disability who are working in fields requiring interests and abilities similar to his own should be helpful in broadening his perspectives and those of the rehabilitation worker as well and may suggest specific employment objectives and possible means of attaining them.

3. It will be useful both to worker and client to know how employed people have achieved their successes, including special arrangements, if any, that have enabled them to meet the requirements of their jobs. (5)

To utilize this type of follow-up information should not be seen as a return to the use of the now outmoded lists of jobs by disability. The unique attributes of each client must be kept in mind and the data presented for illustrative purposes and to provide fuel for hope and motivation. Furthermore, rehabilitation workers and patients can find inspiration by learning of the courage, perseverance, ingenuity and dedication required of the first quadriplegics and professional workers who overcame the obstacles to vocational rehabilitation.

It was with these values in mind that we conducted two surveys:

1. All former patients of IPMR who were quadriplegics were followed up.

2. Agencies that might be in a position to provide vocational information about the employment experiences of the quadriplegic were contacted.

B. SURVEY OF QUADRIPLEGIC EX-PATIENTS

Methodology

Our aim was to contact the quadriplegics who had been discharged from IPMR since its opening in 1948. Such individuals were identified from the medical records. A double postal card was sent to each individual asking two questions:

1. Are you employed?
2. If not employed now, have you been employed since leaving the Institute?

To those who were employed or had been employed, a letter of thanks was sent with an explanation as to why additional information was being requested. A questionnaire was enclosed with the letter asking for detailed vocational information.

After about four weeks, a letter was sent to those individuals who had not returned the original postal card inquiring about their employment status.

To those individuals who had replied that they had been unemployed since leaving IPMR, a double postal card was sent asking them to check one of seven reasons for their not working. (See Table 12 for check list of reasons.)

After two to three weeks, a letter was sent, together with another questionnaire to those individuals who had reported employment but had failed to return the initial questionnaire.

Results

1. Replies

Postal cards concerning employment status were sent to 392 individuals. This is a total computation of all former IPMR patients who were identified from medical records as quadriplegics. 29 postal cards were returned because of "address unknown" and eight replies indicated that the patients were now deceased. This left a group of 355 individuals from whom we might receive responses. From this population of 355, postal card replies were received from 177 individuals or virtually 50 per cent.

2. Employment Status

69, or 39 per cent, of this group of 177 reported that they were employed. 108, or 61 per cent, indicated that they were unemployed, but among these were 18 who were attending college to prepare for employment. Thus, if we total the 69 employed and the 18 in college, we have 87, or 49 per cent, who are either employed or actively engaged in a vocational plan. We recognise that there is undoubtedly a bias in these data since it is unlikely that there were as many employed among the 178 individuals who did not reply to our mailing.

3. Types of Employment

Information on types of employment was obtained from 54 of the 69 who reported that they were employed. The list of jobs held by these respondents is shown in Table 1. 15 were employed in professional occupations; 15 in managerial; 13 in clerical; seven in sales and four in skilled. Five respondents reported homebound employment in telephone soliciting, television monitoring, and crafts. Eleven individuals were self-employed.

Since our sample is small and based only on patients of IPMR, no generalizations can be made about the quadriplegic population as a whole. Our data show that quadriplegics are employed in a variety of professional, managerial, sales and clerical occupations, and in a very few skilled occupations. The preponderance of employment is in the professional-managerial (56 per cent) and in the sales-clerical (37 per cent) fields.

4. Distribution by Industrial Classification

Using the groupings in the Standard Industrial Classification Manual, shown in Table 2, business services, medical services and retail trade account for 42 per cent of the employed group. Manufacturing accounted for only 10 per cent and only one of these jobs was in production. The remainder was evenly distributed among nine other industries. Only outdoor settings are absent from the list. It cannot be concluded that the industries represented hold the highest number of prospective jobs for quadriplegics because the occupations held by respondents are, of course, not unique to the industries represented but rather are found in most industries. It would appear more important to place emphasis on occupation rather than the industry.

Table 1

TITLES OF OCCUPATIONS HELD BY QUADRIPLEGICS
Survey of IPMR Ex-Patients

PROFESSIONAL (15)

**0-01	Accountant, Tax	1
**0-04	Artist	1
0-06	Editor, Assistant Books	1
0-11	Instructor, College (History)	1
0-22	Attorney, Research	2
0-22	Justice, Municipal Court	1
0-23	Librarian, Medical Records	1
0-26	Doctor of Medicine	1
0-32	Coordinator, University Program (Hotel Management)	1
0-32	Occupational Therapist	1
0-35	Physicist, Research	1
0-36	Historian, Research	1
0-39	Chief Examiner, Personnel	1
0-44	Artist, Advertising Layout	1

CLERICAL (13)

**1-01	Bookkeeper	1
1-01	Bookkeeper	4
1-03	Television Monitor	1
1-05	Clerk, General Office	1
1-18	Clerk, Publication	1
1-18	Clerk, Information	3
1-33	Secretary	2

MANAGERIAL (15)

**0-72	Manager, Retail Sales	1
**0-72	Manager, Auto Service	1
**0-72	Manager, Office Cleaning Service	1
**0-72	Manager, Farm Machine Sales	1
**0-72	Manager, Gift Shop	1
0-72	Manager, Assistant (Catalog Department)	1
0-74	Manager, Assistant (Department Store)	1
0-91	Director of Purchasing	1
0-97	Manager, Contributions	1
**0-97	Manager, Telephone Service	1
0-98	Consultant, Finance	2
0-99	Administrator, Religious Grants	1
0-99	Director of Volunteers	1
0-99	Commentator, Radio	1

SALES (7)

1-52	Broker, Securities	3
*1-55	Sales, Telephone	3
**1-57	Broker, Insurance	1

SKILLED (4)

*4-71	Craftsman, Jewelry & Leathercraft	2
**4-71	Watchmaker	1
5-09	Orthotist	1

TOTALS

Professional	15	27.8%
Managerial	15	27.8%
Clerical	13	24.1%
Sales	7	12.8%
Skilled	4	7.4%
	54	99.9%

*Homebound	5
**Self-Employed	11

Table 2

INDUSTRIAL CLASSIFICATION OF OCCUPATIONS HELD
(50)

Business Services	7	Medical Services	7
Communications	1	Printing & Publishing	3
Education	2	Private Foundations	2
Finance	4	Repair Service	3
General Office	2	Retail Trade	7
Government Service	4	Transportation	1
Insurance	1	Warehousing	1
Manufacturing	5		

5. Department and Firm Size

The modal department, as shown in Table 3, is from one to ten employees. The size of the firm produced a bimodal distribution of under 25 and more than 100 employees. Thus, the respondents work in small departments and in either small or rather large organizations. These findings may serve as placement guides, but neither the rationale nor the significance of these findings can be stated.

Table 3

SIZE OF FIRM AND DEPARTMENT

FIRM SIZE		DEPARTMENT SIZE Number of Workers	Frequency
Under 25	16	1-10	18
25-50	4	11-20	5
50-100	4	21-30	4
More than 100	15	31-40	1
		41-50	2
		51-60	1
		61-70	0
		71-80	1

6. Working Environment

90.1 per cent of employed quadriplegics reported that they work with or around others. These findings have considerable significance because the most suitable jobs, as revealed by this survey, involve dealing with people to some extent, ranging from occasionally to full time. It is interesting to note in this regard that most rehabilitation workers feel that physical appearance plays a very definite role in the acceptance of disabled individuals by a prospective employer and this is especially so in occupations requiring contact with the public. Those who have done placement with the severely disabled know, too, that some employers are concerned (or so they say) with the possibility that some of their employees may not accept the visibly severely disabled as their co-workers. It is apparent from this survey that physical appearance was not a deterring factor for quadriplegics in obtaining employment in occupations where they would be seen and worked with.

7. Means of Obtaining Job

About 49 per cent of employed respondents obtained their jobs through their own efforts, 30 per cent through friends, and less than 9 per cent through the state rehabilitation agency, as shown in Table 4. No respondents reported obtaining employment through the public employment service.

Table 4

MEANS OF OBTAINING JOB
(47)

	Frequency	Percentage
Through Own Efforts	23	43.9
Through Friends	14	29.7
Through State Rehabilitation Agency	4	8.5
Returned to Former Employer	4	8.5
Through Private Employment Service	1	2.2
Through Newspaper Ad	1	2.2
Through State Employment Service	0	0.0

While obtaining employment through one's own efforts should be encouraged by counselors, it is questionable whether many quadriplegics can accomplish this, taking into account the many problems surrounding the successful employment of a quadriplegic. Perhaps it is the more adequate and resourceful quadriplegics who find jobs on their own. The remainder may consist of many individuals who could work successfully if they received the help they require in finding employment.

Whether many of the unemployed and those not reporting received such help is not known. The absence of any reported help from the public employment service is conspicuous.

8. Training for Employment

36 per cent, or 18 of the employed respondents, utilized their pre-injury educational experience in their current employment. (Table 5) In this group are the professional, slaes and office workers who were able to return to the same or similar fields. 11 or 22 per cent, entered fields that required no substantial training except for a brief "breaking in" period. Here are included retail sales, telephone soliciting, and clerical jobs. 21 or 42 per cent utilized some form of post-injury training to prepare for employment. 16 out of this group of 21 attended a formal school—nine college and seven commercial or business school. On-the-job training included training in the trades, art, and occupational therapy fields.

It is significant that such a large proportion of respondents obtained training after they had sustained their disability. This reflects not only the need for training but also the possibility of undertaking training or education successfully with a quadriplegic.

Table 5

TRAINING AND EXPERIENCE UTILIZED IN WORK SITUATION
(50)

		Frequency	Percentage
Pre-injury		18	36
Post-injury			
Education	9		
Business and trade school	7		
On-the-job	5		
	21	21	42
No training required		11	22

9. Sponsorship of Training

Employers provided for the training of seven of the respondents.(Table 6) This included on-the-job training and several school programs paid for by the employers. Four respondents reported that rehabilitation agencies sponsored their program. The remaining ten were distributed among such sources as self-payment, family, and scholarships. It is possible that some of those who reported on-the-job training at employer's expense were, in fact, sponsored by state rehabilitation agencies who paid a training fee to the employer. 18 months is the longest training program reported as sponsored by the state rehabilitation agency. The self-sponsored or family-sponsored programs are, with one exception, college level training lasting from four years to nine years. These data raise some question about the state agencies' participation in the sponsorship of training for the long periods of time required by a profession. Unless the state rehabilitation agency has sufficient confidence in the potential employment success of a quadriplegic, only those quadriplegics with sufficient personal or family financial resources can pursue the training necessary for the quadriplegic whose best employment potential lies in a profession.

Table 6

SPONSORSHIP OF TRAINING
(21)

	Frequency
Employer	7
State Rehabilitation Agency	4
Self	5
Family	3
Scholarship	1
Unknown	1
Total:	21

10. Transportation to Work

Transportation is a formidable problem for many quadriplegics because of two major obstacles. The disability may be so severe as to make transfers between wheelchair and automobile very difficult. Several respondents, for example, use a mechanical lift for transfer, and secondly, transportation is often very expensive. Table 7 indicates that of 48 employed respondents, 17 or 35 per cent had employment that did not require transportation. This includes 12 in homebound work, or in a business operated from their home, three who worked near enough to their home to enable them to travel by wheelchair, and two who had institutional live-in jobs.

31, or 65 per cent, of the respondents used transportation, 15, or almost 50 per cent, drove their own cars. Six more owned their own cars and hired someone to drive them. Relatives and friends drove five individuals and the remaining five went either by a taxi or private transportation carrier.

Table 7

METHODS OF TRANSPORTATION
(48)

Transportation Required		31
Drive own car	15	
Chauffeur (owner)	6	
Driven by relatives or friends	5	
Taxi or private transportation	5	
No Transportation Required		17
Work at home	12	
Work near home (use wheelchair)	3	
Live-in job	2	

The high percentage of quadriplegics driving their own cars merits consideration. Quadriplegia does not necessarily rule out driving. There is variation in the residual functional capacities of the upper extremities reflecting the level and nature of the spinal injury. Evaluation of the residual capacities and the development of suitable devices and special car equipment may enable some severely disabled quadriplegics to drive safely. Sometimes a car can be modified in order to permit a quadriplegic to drive while remaining in his wheelchair. Ability to drive oneself may sometimes be a crucial factor in permitting a quadriplegic to obtain suitable employment. Advice of specialists in driver evaluation for the disabled should be obtained before driving is ruled out as a possibility.

11. Job Adjustments

40 per cent of employed respondents reported that a job adjustment was necessary in order to make it possible for them to work. A list of the types of job adjustments is presented in Table 8. About half the adjustments involve equipment, mainly special telephone devices and desks suitable for wheelchairs. 30 per cent of the adjustments are environmental changes such as special toilet and lavatories, a ramp, and permission to use a guest parking lot. A hospital converted a waiting room into living quarters for a live-in worker. Three respondents reported modification in job duties.

It is significant that 60 per cent of employed respondents needed no special adjustments and only a few adjustments appear to require any substantial expenditure.

Table 8

SPECIAL ADJUSTMENTS MADE ON JOBS

Type of Equipment	
Special Telephone	4
Electric Typewriter	1
Special Desk	4
Adjusted height of Desk	1
Provide Low Cabinets	1
Special Couch	1
Standing table with Parallel Bars	1
	13

Environmental	
Special Lavatory	3
Assignments of Office near class	1
Ramp for County Judge's Bench	1
Permission to use Guest Parking Lot	1
Converted Hospital Waiting Room into Living Quarters	1
	7

Job Duties	
Store merchandise rearranged to be accessible from wheel chair.	1
Records delivered and picked up from desk	1
Not expected to visit department offices in other buildings.	1
	3

12. Salary

Information on salaries was obtained from only 23 employed respondents. The data are presented in Table 9. Yearly salaries ranged from less than $1,000 to $25,000. The biggest salaries represent stock and insurance brokers, attorneys and administrators. In the lower income bracket are office, homebound, and part-time employees.

Table 9

SALARIES

Salary Range	Frequency	
	Starting Salary	Present Salary
20,000 - 25,000	0	1
15,000 - 20,000	0	1
10,000 - 15,000	5	4
8,000 - 9,000	0	1
7,000 - 8,000	2	2
6,000 - 7,000	1	1
5,000 - 6,000	1	3
4,000 - 5,000	2	0
3,000 - 4,000	3	4
2,000 - 3,000	4	4
1,000 - 2,000	3	2
0 - 1,000	2	0
	23	23

13. Job Satisfaction

Employed respondents in some instances gave more than one reason for liking or disliking a job, and occasionally they gave reasons for liking together with reasons for disliking the same job. Hence the number of responses add up to more than the number in the group of employed respondents.

Among the factors related to liking a job, 53.2 per cent refer to job duties. Among the factors related to disliking a job, the largest number—46 per cent—refers also to job duties. Table 10 shows the distribution of factors.

It is interesting to compare these findings with the findings of others. In a study made at the University of Minnesota (9), they found that the most frequently mentioned reason for either liking or disliking a job was the type of work involved. Super reports that among the reasons given by non-handicapped workers for liking or disliking work, type of work was the most frequently mentioned reason, with economic reasons ranking second, and managerial policies third. (10)

The similarity between the reasons given by disabled and non-disabled workers for liking or disliking a job is remarkable and supports a counseling and general placement approach which minimizes disability except as it affects actual job performance.

Table 10

JOB SATISFACTION AND DISSATISFACTION

	Reasons for Liking Job	Reasons for Disliking Job
Salary	5	2
Work Environment	4	1
Duties of the Job	25	7
Location of the Job	4	0
Status of the Occupation	7	2
Hours	2	3

14. Opportunities for Advancement

This is a seldom touched upon area in most follow-up studies of the employed disabled. Only 15 of the employed respondents, or 33 per cent, answered this question. It could be that the remaining 67 per cent did not know if opportunities for advancement existed or that they did not care to think about the future, but rather preferred to be thankful for what they had.

Of the 15 responses which were received, nine reported no opportunities for advancement and six reported that there were such opportunities. The responses were too few to allow for any interpretation.

15. Length of Employment

Duration of employment ranged from three months to five years. 74 per cent of employed respondents had worked from one to five years, 24 per cent from six months to one year, and two per cent from three to six months, at the time of this survey. The ability of the quadriplegics who were surveyed to remain employed is shown significantly.

16. The Self-Employed

Eleven of the employed respondents, representing 20 per cent of the total employed group, are in their own businesses as shown in Table 11. Ten are in business service or sales while the 11th person is in a combined sales and repair service. The activities called for in these types of business enterprise closely parallel those performed by respondents who are working for others—the remainder of the employed group.

Table 11

BUSINESSES OPERATED BY SELF-EMPLOYED QUADRIPLEGICS
(N=11)

Business	Size of Community
At Home	
Bookkeeping Service	Less than 25,000
Jewelry Making and Leathercraft	" " "
Magazine Subscription Agency	" " "
Telephone Answering Service	" " "
Near or Adjacent to Home	
Farm Machinery Sales and Service	Less than 25,000
Tax Accounting Service	" " "
Watch Repairing Service	" " "
Requires Transportation	
**Gift Shop	Less than 25,000
**Office Cleaning Service	" " "
*Auto Service Station	86,000
**Package Liquor Store	Over 2,000,000

**Driven by others
*Drives own car

Seven of the 11 operate their businesses either in the home, adjacent to the home, or near the home. The location of their business thus eliminates transportation as a problem for most of the self-employed respondents.

The businesses of eight of the reporting individuals were personally financed. In two instances the business was started with the support of a state rehabilitation agency. Two individuals secured a bank loan.

The technical assistance required to operate the business was only training and was required by four individuals. Three of these obtained training after they had become disabled, while the fourth utilized his pre-injury education.

Income was not reported in monetary terms in most instances. Five reported that they had an income sufficient to take care of their living expenses; four reported that they did not have an adequate income. Reported income ranged from an average of $5.00 per week to a gross of $950.00 per month. A possible limitation on income for two of the respondents is probably part-time status due to lack of physical tolerance for a full work schedule.

Nine of the eleven are in communities of less than 25,000 which may indicate greater opportunity for self-employment in smaller communities.

17. The Unemployed

Barriers to employment were classified into eight categories, shown in Table 12. 42, or 47 per cent, of the 90 unemployed respondents furnished reasons for not working.

28 of these 42 respondents indicated that they were not physically able to work. Transportation was given as the reason by only one individual, and only two reported insufficient help in finding work. Three stated that they had insufficent skills; five that no jobs were available.

It is interesting that the disabled people in the Minnesota survey (9) felt that the major difficulties in finding and in holding jobs were employer resistance (especially due to insurance problems) and physical limitations imposed by the disability (especially limited physical mobility) in that order.

It is difficult to interpret the large proportion which attributed unemployment to their physical inability to work. The many physical concomitants of quadriplegia make this a most difficult and unpredictable condition to manage, both for the physician and the patient. It may be that many of these would be able to work if they knew what they were capable of doing; some may be at a loss as to what they are physically able to do; some may be unaware of vocational opportunities.

Table 12

FACTORS CONTRIBUTING TO NON-EMPLOYMENT
(N=42)*

I am not working because:	
1. I cannot find work	
A. No jobs available	5
B. Insufficient skills	3
C. Insufficient help in finding work	2
2. I can't get transportation	1
3. I am not physically able to work	28
4. I do not need a job	7
5. Home responsibilities prevent my working	0
6. Other (specify) Hospitalized	4

*Some indicated more than one reason for not working

Just as the employed are a very important group to study, as they can furnish us with information about what quadriplegics can do and how they can achieve vocational rehabilitation; so are the unemployed an equally important group to study, as they can furnish us with indicators of the barriers to the employment of quadriplegics. Some of the unemployed may represent the failures of those of us who render rehabilitation service. It is clear that more intensive evaluation is necessary to obtain an accurate picture of the reasons for unemployment. The difficulties of reaching a large enough sample of the unemployed in any group are increased by the reluctance of many of the unemployed to be identified due to feelings of failure, inferiority, shame and frustration. First-hand knowledge, obtained through interviewing, could go a long way toward understanding the problems of the unemployed and could be a long first step toward their solution.

C. SURVEY OF AGENCIES

The purpose of the agency survey was to collect data on the experiences of others who may have worked with quadriplegics. We first contacted local agencies and workshops serving the severely disabled in the New York City area. Only three of six agencies contacted were prepared to handle wheelchair clients and their operations were, in general, geared toward activities requiring effective use of at least one good upper extremity. They were not in a position to contribute any substantial information on quadriplegics.

54 State and Territorial Offices of Vocational Rehabilitation, 57 Chapters of the National Society for Crippled Children and Adults, and 23 Easter Seal Societies were contacted for reports, summaries, or experiences in the vocational rehabilitation of quadriplegics. 30 Offices of Vocational Rehabilitation, 14 Chapters of the National Society for Crippled Children and Adults, and 6 Easter Seal Societies responded to our request. From these 50 replies, only six could offer us any information, although many indicated that they had a few scattered instances of successful placements. The Paralyzed Veterans Association cooperated by conducting their own survey.

The agency survey did not provide too much useful information. Agencies did not generally have available data and case material concerning the quadriplegic. The survey indicated that there is a need for clarifying the definition of quadriplegia used in most rehabilitation agencies and in the coding system established by the Federal Vocational Rehabilitation Agency to provide for the ready identification of quadriplegics. Much valuable information is not readily available because of the lack of a clear method of identification.

The agency survey and the June 1957 study made by the Veterans Administration (5) basically confirm the data from our follow-up study of IPMR quadriplegics. A list of occupations uncovered by the survey and study are found in Table 13.

Table 13

TITLES OF OCCUPATIONS HELD BY QUADRIPLEGICS

Reported in Agency Survey

PROFESSIONAL & SEMI-PROFESSIONAL
- 0-01 Consultant, Tax
- 0-04 Artist
- 0-06 Literary Writer
- 0-06 Newspaper Editor
- 0-17 Radio Engineer
- 0-19 Consultant, Heating & Ventilating Equipment
- 0-22 Lawyer
- 0-23 Librarian
- 0-32 Tutor
- 0-48 Draftsman-Architectural
- 0-68 Employment Interviewer
- 0-69 Radio Announcer

MANAGERIAL
- 0-74 Merchandise Manager
- 0-82 Oil Broker
- 0-87 Manager, Apartment House
- 0-98 Insurance Office Manager

CLERICAL
- 1-04 Route Clerk
- 1-18 Clerk, Collection (Telephone)
- 1-25 Calculating Machine Operator
- 1-33 Secretary, Motel
- 1-34 Expediter, Outside
- 1-37 Clerk-typist
- 1-49 Estimator (Building Trade)

SALES
- 1-55 Salesman, Telephone
- 1-57 Salesman, Insurance
- 1-63 Salesman, Real Estate
- 1-80 Salesman, Catalog
- 1-86 Salesman, Paper Products

AGRICULTURAL
- 3-37 Manager, Farm

SKILLED
- 4-32 Cabinet Maker
- 4-40 Job Printer
- 4-71 Watch Maker
- 4-71 Novelty Crafts Bench Worker

SEMI-SKILLED
- 6-19 Weaver
- 7-84 Machine Saw Filer

PART IV. PROJECT FUNCTIONS AND SERVICES

A. A COMPREHENSIVE REHABILITATION SERVICE

Array of Services Available to Project

In this section we will describe and evaluate the services and techniques we have developed and utilized in the vocational rehabilitation and placement of quadriplegics and other severely disabled.

It should be borne in mind that this project was based in an institutional setting—in a private, medically oriented, comprehensive rehabilitation center. The project's activities can be better appreciated if we first present in outline form the total array of Institute services that were available to the placement counselor and to placement clients. These services included the following:

1. Medical Services
2. Physical Therapy
3. Occupational Therapy
4. Orthotics Service
5. Speech Therapy
6. Psychiatric and Psychological Services
7. Case Work Services
8. Recreational Services
9. Volunteer Services
10. Vocational Rehabilitation Services
    a. Counseling
    b. Vocational Evaluation and Adjustment
        (1) Testing
        (2) Pre-vocational Evaluation
        (3) Vocational Adjustment Training
    c. Placement Services
        (1) Selective Placement Counseling
        (2) Direct Job Referrals
        (3) Committee for the Specialized Placement of the Handicapped
        (4) Liaison with Community Placement Resources
        (5) Job Promotion
        (6) Employer-education
    d. Financial Assistance
        (1) Small Business Loans
        (2) Transportation Expenses
        (3) Down-payment, automobile
        (4) Tutoring and training
        (5) Expenses Related to Employment and Self-Employment

Evaluation of Physical Capacities

The development of a realistic employment goal for an individual with quadriplegia requires a number of specific items of information about his physical capacities. The following is a check list of the medical and physical factors that must be assessed:

Physical Capacities Check List for Quadriplegics

1. Bladder and bowel management. Does the client have control of bladder and bowel function? Does he need assistance during the work day? Are special toilet facilities necessary in the work environment?

2. Sitting tolerance. How many hours of continuous sitting can be tolerated?

3. Muscle contractions. Is he subject to muscle contractions? Will contractions be a problem on the job?

4. Kidney, bladder and respiratory infections. Will he be absent from work frequently because of proneness to infections?

5. Independence in eating. Will he need assistance in eating his lunch?

6. Wheelchair independence. How proficient is he in manipulating his wheelchair? Will he need assistance?

7. Transportation. Is he independent in transferring from wheelchair to car? If not, what assistance is required?

Evaluation of Job-Task Performance

How well can the quadriplegic perform job-related activities? What types of modifications are necessary to enhance his performance? Here we are concerned with such questions as ability to handle pens, paper, telephone, typewriter techniques, the type and height of a desk, the ability to file and to manipulate a filing cabinet, etc. The answers to these questions were obtained by evaluation in our pre-vocational unit, and when necessary, in consultation with a specialist in orthotic devices. This type of evaluation enabled the placement counselor to define task capabilities and work requirements. It also permitted us to describe a client's performance to an employer with confidence and authority.

Vocational Adjustment Training

When indicated, actual work experiences within the Institute were provided to evaluate work habits and problems and to assist the client indeveloping satisfactory work habits, self-confidence and morale. A variety of job experiences were available including clerical, secretarial, receptionist, gift shop sales, library assistant, and food service.

Psychosocial Services

The Institute's psychiatric, psychological and case work services were available for evaluation and help with emotional, social, family and economic problems. The ready availability of these services were sometimes crucial in overcoming obstacles to employment.

Group Counseling

A group counseling program was initiated by the project. It was known as the "Placement Clinic." Led by the Chief of Vocational Services and the Placement Counselor, a group of placement clients discussed their employment problems. Because of staffing problems, the Placement Clinic was discontinued after about three months. We feel that a group counseling program can be an effective technique in helping disabled clients deal more effectively and more realistically with employment problems.

B. THE JOB PLACEMENT PROGRAM

The services that we have thus far described have a common objective, to make the disabled individual employable. Employability is defined as the ability to carry out the duties and responsibilities of a job. The placement activities and techniques to be described in this section have the objective of making the "employable" individual "placeable," i.e., to provide him with a suitable job. An employable person may not be placeable because there are no jobs available that are suitable for his skills and the needs of the client. If placement activities are continued long enough, a suitable job can often be found for the employable client.

4. The fourth factor that we feel played an important role in the placement of many of the severely disabled is the project setting, that is, the basing of placement services in a medically oriented rehabilitation center where most of our severely disabled had previously been medical patients. The continuing interest and assistance of their "medical alma mater" provided the support and nurturance that some of them needed to maintain their hope and morale. In addition, their visits to the Institute were often more than an interview with the Placement Counselor. The social contacts with patients, volunteers, staff members, and participation in recreational programs within this semi-protected institutional setting provided a transitional experience for some that served as a bridge to the world of work.

5. IPMR's extensive experience in the rehabilitation of the quadriplegic and the staff's years of experience provided a reservoir of familiarity, skill and know-how that facilitated the vocational rehabilitation of the quadriplegic.

6. The ready availability of a comprehensive array of rehabilitation services aided in the solving of problems that might otherwise have become serious obstacles to employability and placeability.

Job Placement and Promotion Techniques

The specific types of placement and job promotion techniques utilized during this project are described in this section:

1. Mail Promotion

A letterhead of the Committee for the Specialized Placement of the Handicapped was utilized. The letterhead's left hand margin listed all Committee members and their business affiliation. Listed as consultants were the following members of the Institute staff: the Director, the Administrator, Director of Volunteers, and Chief of Vocational Services. The Placement Counselor's name was printed separately on the top right. Correspondence was signed by the Placement Counselor. Mail promotion included general solicitation for job openings, and presentation of a specific client for a specific job. Several members of the Committee carried out mail promotion using their own business letterhead to circularize a group of business and professional contacts.

2. Telephone Solicitation

Calls were made to prospective employees whose names were obtained from directories, newspaper ads, and business publications, as well as to employers who were recommended by Committee members, staff, and clients.

3. Field Visiting

Prospective employers were visited to promote specific clients or for general promotional purposes such as interpreting the work of our project, providing employers with information about business and industry's experiences in hiring the handicapped, and learning more about employer's attitudes toward the severely disabled.

4. Utilization of the Committee for the Specialized Placement of the Handicapped

Committee meetings were held about six times a year at the Institute. A roster of clients ready for placement was given to each member, briefly describing each client's qualifications, skills, handicap, and vocational goal. Several placement clients were usually presented personally at each meeting. The Committee discussed each client, the validity of his vocational goals, modifications that might increase his job opportunities, types of firms where suitable jobs exist, and specific employers to be contacted either by Committee members or the Placement Counselor. The Placement Counselor coordinated the Committee members' placement activities between meetings.

5. Utilization of Community Placement Resources

In a number of cases we found that project services enabled clients to make effective use of regular community placement resources. Project services, by developing suitable goals, defining job-task capacities and modifying attitudes, made it possible for clients to use agency services for which they had previously been ineligible. The project Placement Counselor worked closely with the Division of Vocational Rehabilitation, Just-One-Break (JOB) and the New York State Employment Services. These agencies were successful in placing a number of carefully selected clients. The Personnel Department of the New York University Medical Center was very useful as a resource. It serviced two hospitals and a medical school providing a large variety of potential jobs in a setting where the staff often had positive attitudes toward hiring the disabled.

6. Financial Assistance

Our experiences in the placement of the severely disabled pointed up the need of funds for a variety of purposes related to making a client qualified and available for a job. The policies of community agencies did not allow funds for some of these purposes, or their procedures necessitated a long period of delay. In some cases, they considered a plan "too risky" to warrant their sponsorship.

The Committee for the Specialized Placement of the Handicapped assumed the responsibility of raising funds for this purpose. This fund was initiated in February 1960. A brief description of some of the uses to which it was put will indicate the role that it played:

> Private transportation required for visiting the Institute and going to job interviews.(Funds for this purpose were also provided for in the project grant.)
>
> Small business loans.
>
> Brief training programs. (switchboard, manicuring)
>
> Correspondence courses.
>
> Down payment on automobile.
>
> Purchase of electric typewriter.
>
> Cost of foster home placement.

7. Transportation Problems

During the second year of the project an effort was made to explore solutions to the problem of the high cost of transportation in New York City for the disabled worker requiring private transportation. A transportation specialist who was a member of the Committee for the Specialized Placement of the Handicapped was involved in this endeavor. The project was unable to make any basic headway in dealing with the problem. In 1954, a study had been conducted by the Welfare and Health Council of New York City. 32 agencies participated and made recommendations that have not as yet been carried out to the point where they might benefit the employed individual.

In individual cases we were able, with the assistance of the Committee's transportation consultant, to provide transportation to individuals unable to make their own arrangements. Arrangements for private transportation in New York City is generally not a problem if the worker can assume the cost of the service, but transportation may cost up to ten dollars per day. Thus, with lower income workers, there sometimes may be no motivation to seek employment.

PART V. RESULTS OF PROJECT SERVICES

A. CRITERIA OF ELIGIBILITY FOR SERVICES

Placement of the severely disabled involves factors which may complicate the problem. The project's statement of purpose includes three factors to be considered in determining an individual's eligibility for service: quadriplegia; severe neuromuscular impairment; feasibility (i.e., the ability to qualify) for service from other resources, such as rehabilitation agencies, state employment services or a specialized placement service like Just One Break (J.O.B.)

The first factor, quadriplegia, a condition of paralysis affecting all four extremities, can be determined objectively. Severity of disability, however, is a subjective factor and would often involve an arbitrary judgment. "Feasibility" is also subjective. Acceptance or rejection for an agency's services on the basis of "feasibility" may depend on factors that do not necessarily reflect the objective vocational potential of the applicant. Furthermore, it would be arbitrary to refuse project services to an individual who has been accepted for service by a rehabilitation or employment service, since such acceptance does not guarantee that he is receiving services adequate to his needs.

Early in the project, it became apparent that it would not be realistic or fruitful to attempt to set up objective or standardized criteria for eligibility based on extent of disability, or to reject cases arbitrarily if they had been accepted for service or were eligible for service by other agencies.

Our placement services policy was based on the following factors:

1. A primary interest in the vocational problems of quadriplegics and of other severely disabled.

2. To provide services to physically disabled individuals who either, because of extent of disability, or other factors, possessed a severe employment handicap.

3. Denial of placement services to an IPMR patient on the basis of degree of disability or handicap was not a tenable practice. It could be a rejecting or disturbing

experience to a patient who felt entitled to all relevant Institute services.

4. Placement services and activities would be determined primarily by 1 and 2 above and by our focus on quadriplegia and severe employment handicaps. Extent of service to less handicapped clients would be limited and geared to enabling them to use other community resources.

B. DESCRIPTION OF THE PROJECT POPULATION

Age and Sex of Total Population Served

The Placement Counselor provided service to 100 individuals. Distribution by age and sex are shown in Table 14. 59 per cent of our clients were men. 79 per cent were less than 45 years of age, with 62 per cent between the ages of 20 and 39.

Table 14

AGE AND SEX OF TOTAL POPULATION SERVED

Age	Male (No.)	Female (No.)	Total No.
17-19	5	4	9
20-24	11	10	21
25-29	7	9	16
30-34	5	4	9
35-39	11	5	16
40-44	6	2	8
45-49	2	2	4
50-54	7	3	10
55-59	4	1	5
60-64	1	1	2
	59	41	100

Types of Placement Service

Not all of this total group of 100 were offered intensive placement services. As shown in Table 15, 18 or 18 per cent received placement counseling only. Most of this group (15) were Institute patients who lived outside of the New

York City area. The Placement Counselor, usually at the request of the vocational rehabilitation counselor, counseled patients and served as a resource in developing realistic vocational goals and plans. This included not only gathering of general job demands data and labor market information, but also contacting appropriate agencies in the client's home area concerning the types of opportunities realistically available to him.

Table 15

TYPES OF PLACEMENT SERVICES

	Number	Percentage
Intensive Placement Services	62	62
Placement Counseling Only	18	18
Placement Services Terminated	20	20
	100	100

In the "Counseling Only" group are also included three clients with minor handicaps who, it was felt, were fully able to use community placement services successfully.

20 clients received services that terminated without employment being achieved. The reasons for termination of service are presented in Table 16.

Table 16

REASONS FOR TERMINATION OF PLACEMENT SERVICES

Reasons	Number	Percentage
Motivation, attitude, etc.	6	30
Client ended contact-reason unknown	5	25
Acute or disabling health condition	5	25
Unemployable	2	10
Available for summer job only	1	5
Marriage plan	1	5
Total:	20	100

Motivational and attitudinal problems characterized six of the above group. Service was finally ended because we were unable to change poor motivation, attitudes, unrealistic demands, etc., that made placement impossible. In five cases the clients themselves ended contact without advising us of the reason. Acute or disabling health conditions developed in five other cases. Two cases with brain damage and psychiatric conditions were found to be unemployable after intensive evaluation. One student was available only for a summer job and one young woman withdrew from the labor market to make plans for her marriage.

C. CHARACTERISTICS OF POPULATION RECEIVING INTENSIVE PLACEMENT SERVICES

Age and Sex

62 cases, then, were provided with intensive placement services. The data presented in Table 17 show that 34 men and 28 women comprised this group. About 74 per cent of the men and 80 per cent of the women are less than 40 years of age. 59 per cent range between 20 and 29. The median age is 25 for men and 27 for women.

Table 17

AGE AND SEX OF CLIENTS RECEIVING INTENSIVE PLACEMENT SERVICE

Age	Male No.	Male %	Female No.	Female %	Total No.	Total %
15-19	3	8.8	0	0.0	3	4.8
20-24	13	38.2	8	28.7	21	33.9
25-29	7	20.6	9	33.0	16	25.6
30-34	0	0.0	2	7.1	2	3.2
35-39	2	5.9	3	10.7	5	8.1
40-44	4	11.8	2	7.1	6	9.7
45-49	1	2.9	0	0.0	1	1.6
50-54	2	5.9	3	10.7	5	8.1
55-59	2	5.9	1	3.6	3	4.8
Total:	34	100.0	28	99.9	62	99.8

Educational Levels

Table 18 presents the educational levels of the group. The bulk of our clients were a high school group. 71 per cent of the women were high school graduates, 3.6

per cent had some high school and 10.7 per cent had some college but had not completed work for a degree. The proportion of men continuing education beyond high school is somewhat larger than that for women: 35 per cent (12) compared to 21 per cent (6) for women. Five men and one woman completed college. One man and one woman had done some graduate work. One man and one woman had completed graduate studies.

Table 18

EDUCATIONAL LEVELS OF CLIENTS RECEIVING
INTENSIVE PLACEMENT SERVICE

Educational Level	Male		Female		Total	
	No.	%	No.	%	No.	%
Partial Elementary	-	-	1	3.6	1	1.6
Complete Elementary	-	-	-	-	-	-
Partial High School	6	17.7	1	3.6	7	11.3
Complete " "	16	47.0	20	71.4	36	58.1
Partial College	5	14.7	3	10.7	8	12.9
Complete " "	5	14.7	1	3.6	6	9.7
Partial Grad. Work	1	2.9	1	3.6	2	3.2
Complete "	1	2.9	1	3.6	2	3.2
Total:	34	99.9	28	100.1	62	100.0

Degree of Disability

Clients are classified into four groups on the basis of degree of disability. Degree of disability was judged in terms of factors that create obstacles to employment. In the "most disabled" group are those who have involvement of all four extremities. Among the obstacles to employment resulting from this type of impairment are:

1. Dependency on others in some of the activities or daily living.

2. Inability to use public transportation.

3. Impairment in use of hands and arms that affects manual work activities and may require special devices and equipment for adjustment to a work environment.

The above group comprises the quadriplegics.

The second classification is labeled "severe impairment of upper extremities." Individuals in this group have severe involvement of upper extremities that present serious obstacles to employment because of limitations imposed on manual performance. The etiology of these disabilities include cerebral palsy, polio, dystonia and muscular dystrophy. A double arm amputee is classified in this group.

Paraplegics comprise the third group, "severe impairment of lower extremities." Individuals in this group cannot use public transportation. There is no serious involvement of upper extremities.

The fourth category, which is labeled "miscellaneous disabilities" includes a variety of disabilities that are not considered severely disabling physically. In most cases, there were personality problems that required intensive support and counseling in addition to placement services. In this category there are clients with cerebral palsy, low back pain syndromes, amputees, and a variety of neuromuscular and orthopedic disorders.

D. DATA ON PLACEMENT OF PROJECT POPULATION

Placement of Quadriplegics

Intensive placement services were provided to a group of 25 quadriplegics. Table 19 shows the distribution of this group by age and sex. There were 11 men and 14 women. The 11 men are in the 20 to 29 year old range. Nine of the 14 women also fall into this range. The remaining five are scattered from 30 to 54 years of age. Thus, 80 per cent of the quadriplegics are in their twenties. This age distribution is typical of the quadriplegic population known to the Institute. For example, of 62 quadriplegic patients admitted to the adult service of the Institute, over a two year period, 46, or about 75 per cent, were between 18 and 29 years of age.

Of the 25 quadriplegics receiving intensive services, 23 were placed in gainful employment. The other two were referred shortly before the project's termination. They will, however, continue to receive service since the project services are now a part of the Institute's regular program.

Table 19

QUADRIPLEGICS RECEIVING INTENSIVE PLACEMENT SERVICE
Number by Age and Sex

Age	Male		Female		Total	
	No.	%	No.	%	No.	%
20-24	5	46	3	21.4	8	32
25-29	6	54	6	42.8	12	48
30-34	-	-	1	7.2	1	4
35-39	-	-	1	7.2	1	4
40-44	-	-	2	14.3	2	8
45-49	-	-	-	-	-	-
50-54	-	-	1	7.2	1	4
Total:	11	100.	14	100.1	25	100.

The occupations held by this group are presented in Table 20.

Table 20

Occupations of Clients Receiving Intensive Placement Service
QUADRIPLEGICS

PROFESSIONAL & TECHNICAL (7)	
Lawyer	1
Copy Writer, TV	1
*Writer-proof reader	1
Counselor Aide	1
*Greeting Card Designer	1
*Photography Tinter	1
*Commercial Artist, lettering	1

MANAGERIAL (1)	
Manager, homemade candy	1

SALES (6)	
*Sales, telephone	6

CLERICAL (9)	
Clerk, general	1
Clerk, information	1
Clerk, reception	3
Clerk, typist	1
*Typist	1
Bookkeeping machine operator	1
Switchboard operator	1

TOTAL:	
Professional & Technical	7
Managerial	1
Clerical	9
Sales	6
	23

*Homebound (11)

The largest group is employed in the clerical fields; nine, or about 40 per cent. Here we have people with varying degrees of hand and arm impairment who were placed in jobs suitable to their limitations. Jobs such as receptionists and information clerk can be performed by some quadriplegics who, with or without special devices, can use the telephone and make notes by pen or electric typewriter. One of the typists had a homebound typing service. The clerk-typist's job did not require typing speed. The clients employed as bookkeeping machine operator and switchboard operator had weakness in their arms and some impairment of the hands.

The second largest group of jobs fall into the professional and technical category, with 30 per cent in this group. Three of these clients were college graduates--the lawyer, TV copy writer, and writer-proofreader. The counselor aide was a high school graduate in a special on-the-job program who was enrolled in a related college correspondence course. The letterer, greeting card designer, and photography tinter used their skills on a homebound basis.

The six clients listed as homebound telephone sales persons cannot all be considered as successfully placed. Only two of this group are satisfied with homebound employment. Problems of productivity and the high cost of transportation are obstacles to outside employment. With continued exploration, some of these clients may be moved into outside employment or into types of homebound employment that may expand their social contacts with others. A new approach to homebound employment was explored by the project, It consisted of a telephone "chaperone" service for sick and older people who were left alone for long periods of time. We envisaged a group of such "customers" referred by and paid for by community agencies or by relatives. The service was to be provided by a group of homebound quadriplegics living in various parts of New York City who would phone a group of "customers" at several scheduled times during the day. If they received no answer, they would contact a relative or designated person to investigate the situation. It was felt that this type of service could provide an opportunity for a homebound group to develop "telephone relationships" with their "customers" offering the possibility of more satisfaction than the usual telephone soliciting. Thus far we have not had enough interested clients to develop this service. It does, however, seem to merit further consideration and may stimulate some new thinking about homebound programs.

The character and content of the quadriplegic's vocational rehabilitation can perhaps be best conveyed through several case summaries. These cases are selected to illustrate the variety of problems that may confront the quadriplegic and the rehabilitation worker.

Our surveys and our placement experience indicate that quadriplegics can attend college and complete training in a variety of professional fields that offer the opportunity for suitable employment. Tables 1, 13, and 20 show the variety of professional fields in which quadriplegics are employed. The qualified professional does not seem to face especially severe obstacles in finding a job. Mr. K.B., a client, demonstrates this type of experience.

> K.B. graduated college in 1956 and was employed as a sales engineer until a diving accident rendered him quadriplegic in 1957, with motor-sensory loss at the C-5 level. During his physical rehabilitation program he decided that he was interested in law and that his previous type of job required too much travel. Following discharge, he enrolled in a law school and received his law degree in June, 1961. He was particularly interested in corporate law, and within a short time obtained a job with the legal department of a large corporation. He has been employed over a year.

The next case describes the experience of another college graduate.

> C.N. became quadriplegic as the result of an automobile accident shortly after he graduated high school. Following his physical rehabilitation he attended college and majored in accountancy. The college was near his home and a member of his family or a friend drove him to school. One of his classes could only be reached by steps. Friends carried him up and down the stairs for one semester. When he graduated he decided that he preferred business administration to accountancy. Within a few months he was hired for a job in the purchasing department of a large firm. His responsibilities stressed knowledge of commodities, dealing with firms, etc. There was a great deal of telephone and personal contact. His

> very limited writing skills were not seen as a serious handicap; reports could be dictated. After several years on this job, he sought and found a better position as director of purchasing. He is doing very well. Transportation is provided by a member of his family.

The evaluation of a quadriplegic's vocational potential and productivity requires a thorough assessment. It is not justified for a counselor arbitrarily to reject a client, as was done in the following case, on the basis of a superficial assessment. Furthermore, many quadriplegics require a relatively long period of adjustment after their disability before they are ready to plan realistically and to use vocational services. Services should be readily available when the individual is ready to use them. The private agency can usually play this role more effectively than the state rehabilitation agency. The quadriplegic may require a variety of services available on a flexible basis. The following case illustrates these points.

> E.C., born in 1942, is a high school graduate in the high average range of intelligence. Upon high school graduation in June, 1959, he worked as a rough carpenter and was hoping to become a time-keeper in the building construction industry. In June, 1960, he became quadriplegic as the result of a diving accident resulting in motor-sensory loss at the C5-6 level. He was an inpatient at IPMR from September, 1960 to March, 1961. He had severe limitations in use of arms and hands. While a patient, he explored a number of activities in the pre-vocational unit. He was able to handle a camera with some difficulty; he learned photography tinting and some light furniture finishing.
>
> Mr. C. was referred to the state rehabilitation agency and a home visit was made by their counselor in May, 1961. The counselor reported that he felt there was not a "reasonable possibility for Mr. C's returning to remunerative employment at that time because he did not have sufficient use of his upper extremities, was unable to transfer from his wheelchair unassisted, was limited in tolerance, plus paralyzed fingers and wrist flexors." The case was closed as ineligible for services.

When Mr. C. returned to the Institute in July, 1961 for a routine urological check up, he was not ready to become involved with vocational services and he rejected a plan to remain at the Institute for further vocational evaluation. He felt that his family and friends could help him develop a business plan. Meanwhile, he was doing a little phototinting for acquaintances.

Between October, 1961 and January, 1962, the Placement Counselor wrote to Mr. C. and made a telephone contact offering to visit his home or to arrange for an office interview. Mr. C. rejected these offers, stating he could wait until his next urological check up. Following this check up in February 1962, he became more interested in working with us and was seen regularly by a staff rehabilitation counselor. On his own, he had ventured into an unsuccessful mail order business, losing $60.00. Initially, his phototinting skills were explored and through contacts made by a Committee member, he has had an increasing amount of work. He has also made productive contacts of his own.

At the present time, Mr. C. is considering the possibility of seeking admission to college. While in high school, he felt he was interested in business administration but he is now uncertain of vocational goals. He had an academic high school course and took the College Entrance Examination. His scores were relatively low but do not rule out the possibility that he can succeed in college level work. He has enrolled in a correspondence course in English as a step in exploring his motivation and ability for college. At the same time, we are continuing to help him develop his phototinting business.

Mr. C. looks forward to his weekly visit to the Institute. He spends most of the day here visiting with friends he has made among patients and staff.

The following case of a boy from a large underprivileged family describes a vocational plan resulting from a combination of "fortuitous" circumstances. It often happens that it is not the professional who finds the solution to the severely disabled individual's vocational rehabilitation. In this case, it is an interested clergyman who helped develop a plan.

> Martin W. was injured in July, 1959, when thrown in the air by a group of friends on a beach outing. He landed on his back, sustaining a fracture-dislocation of the spine at the C5-6 level, resulting in quadriplegia. He was transferred to the Institute from another hospital in February, 1960. Martin is one of 12 children. He completed two and a half years of vocational high school and left in 1956 because he wanted more money. He held jobs as a delivery boy, presser, and laborer.
>
> Martin is an intelligent, responsive, well-motivated young man. His arms were very weak and he had no use of his finger muscles. He worked hard in his physical rehabilitation program and, with the help of a splint, was able to type slowly. At the Institute he received instruction in high school subjects and passed the high school equivalency exam. While a patient, he developed a close relationship with a priest. Prior to his accident Martin had been involved with a group of delinquent boys. The priest felt that he could be trained as a counselor aide on a special project set up to work with teenagers in this community. He would be under the close supervision of a professional case worker. Our counselor agreed that Martin had the potential for this type of work. We provided funds for a correspondence course related to his vocational goal. When Martin left the Institute he was quite frail and able to work only part time. A member of the community project staff drove him to and from the job. Martin has need of support and encouragement. There have been periods when he has found it easier to remain at home. At the present time he is working.

The following case shows some of the problems of a homebound client who prefers outside employment.

> J.N., a post polio quadriplegic, was born in 1938. She is a high school graduate. She is wheelchair bound and has marked limitations of the upper extremeties. She writes and types slowly. In 1957, before the onset of the present project, she obtained a job through the Committee for the Specialized Placement of the Handicapped. Her duties were to answer the phone and do general clerical work. After a week on the job, she was dropped by someone carrying her up a flight of stairs. She became so frightened that she refused to return to the job. Following this experience, she received psychological, case work, and vocational services at the Institute. In December, 1958, she was again determined to find outside employment. At this point the state rehabilitation agency began working with her and in August, 1959 she completed a three week diagnostic vocational evaluation at another facility. Their report describes her as a cooperative, well-motivated and determined young woman. They saw her speech and bi-lingual (English and Spanish) ability as her primary assets and felt that activity outside the home was sufficiently important to warrant placement effort even if working would not be financially profitable.
>
> Miss N. has been an active client with our project since 1959. Efforts to find outside employment have not been successful. Homebound telephone soliciting was arranged. She also does knitting and sells the articles. She is still motivated for outside employment. We are continuing our efforts to place her.

The following case is a story of years of placement efforts, of the continued interest and faith on the part of many people—professional and non-professional; and of the hope and determination of a young quadriplegic boy.

> Harry D. became a quadriplegic in 1950, at the age of 16, as the result of an automobile accicent. Harry, who lived with his family in another state, came to the Institute in 1956, six years after the accident. The staff felt

that he could benefit from further rehabilitation services to make him more independent and to develop better writing and typing skills. He had completed high school on a homebound basis and had never worked.

Harry learned to type 20 words a minute, his penmanship was clear but slow; he used the telephone well. He could wheel his chair on a level surface and needed assistance in transfers.

Harry had tremendous drive and motivation to achieve employment. It was his initiative and persistance that had secured admission to the Institute and resulted in his achieving more physical independence than was thought possible.

When Harry was discharged in June, 1956, he was referred to his state rehabilitation agency. Many agencies and individuals endeavored to find a job for Harry. It was felt that he could work as an information clerk, receptionist, order clerk, etc.

About a year after he left the Institute, Harry wrote to the Institute Director, "When I left the Institute in June, 1956, I was never more happy, for I was certain that at long last I had achieved that rehabilitation that was necessary if a person in my condition was to lead a useful and happy life. Over a year has passed since then, a year in which I have failed to realize these hopes. To me, this does not mean that some day I won't. Until that day I can only do my best and leave the rest to God."

Between 1957 and 1959, several members of the IPMR staff and members of the Committee for the Specialized Placement of the Handiapped were very active in Harry's behalf. Dozens of contacts were made and influential individuals in Harry's home state became interested in finding him employment, with no success.

Early in March, 1959, Harry wrote a letter to a staff member who had been active in making job contacts, asking if there had been any new developments in job possibilities. He comments, "Each day now seems to prove more difficult for me to maintain both physically and mentally a 'status quo.' Perhaps it would be best for me to know now that I am not considered capable of holding a job than to continue a hope that is useless, and which has indeed proven to be most fruitless."

After reports about Harry's failing health and morale, he was brought back to the Institute toward the end of 1959 for a re-evaluation of his physical condition and total situation. The present project had recently been activated and Harry received project services. He was still highly motivated for employment. Initially he wanted employment that did not require him to return home. An intensive job promotion program was initiated to find an institutional live-in job utilizing his clerical abilities, his excellent social skills and his desire and ability to "help" others. A number of institutions expressed "interest" in Harry but no job materialized. Either there was no adequate live-in arrangement or not suitable job open. Finally in July, 1960, arrangements were made for Harry to work in a custodial institution for disabled boys sponsored by a religious organization in another state. He was to help in the library and assist in a teaching program for young boys. Harry left the Institute for this job, full of enthusiasm. 48 hours later he was home with his family reporting that the custodial institution's conditions were "intolerable."

Contact was maintained with Harry. Plans for employment and self-employment were discussed by correspondence and the local welfare agency was involved in joint planning. Early in 1961, Harry was placed in a job in a state hospital in his home state through the joint efforts of persons where his father is employed, representatives of his parish and the staff of the hospital. Harry works in a treatment ward for alcoholics. He does typing, filing, and general clerical work. The patients assist Harry in his dressing and general care. More than a year after his placement, Harry was still working.

Placement of Persons with Severe Impairment of Upper Extremities

Intensive placement services were provided to 12 individuals in our second category, "Severe Impairment of Upper Extremities." Table 21 gives the distribution of this group by age and sex. There are ten men and two women. 58 per cent of this group are in their twenties.

Table 21

CLIENTS WITH SEVERE IMPAIRMENT OF UPPER EXTREMITIES RECEIVING INTENSIVE PLACEMENT SERVICE
Number by Age and Sex

	Male		Female		Total	
Age	No.	%	No.	%	No.	%
20-24	3	30.0	1	50.0	4	33.3
25-29	2	20.0	1	50.0	3	25.0
30-34	-	-	-	-	-	-
35-39	1	10.0	-	-	1	8.3
40-44	2	20.0	-	-	2	16.7
45-49	-	-	-	-	-	-
50-54	-	-	-	-	-	-
55-59	2	20.0	-	-	2	16.7
Total:	10	100.0	2	100.0	12	100.0

Eight clients in this disability category were placed. Their occupations are shown in Table 22. Four cerebral palsy clients with speech problems and severe athetoid movements have not been placed. Of the clients placed, four utilized professional and technical skills acquired before the disability; six have worked over six months; four over a year. One client who left her job after six months has severe psychological problems and is now receiving psychotherapy. Another left his job to undergo surgery for dystonia. The surgery improved his condition and he is now attending college.

Table 22

OCCUPATIONS OF CLIENTS RECEIVING INTENSIVE PLACEMENT SERVICE with Severe Impairment of Upper Extremities

PROFESSIONAL & TECHNICAL (5)
- Lawyer, Real Estate
- Accountant
- Librarian
- Tutor, English
- Electronics Technician

SALES (1)
- * Telephone Solicitor

*Homebound (1)

CLERICAL (2)
- Documentation Clerk
- Tape Recorder Abstractor

TOTAL	
Professional & Technical	5
Clerical	2
Sales	1
	8

Placement of Persons with Severe Impairment of Lower Extremities

There are eight persons in our third classification, "Severe Impairment of Lower Extremities." Table 23 shows that there are four men and four women. None of this group is older than 39. Seven out of eight are between 19 and 29 years of age.

Table 23

CLIENTS WITH SEVERE IMPAIRMENT OF LOWER EXTREMITIES RECEIVING INTENSIVE PLACEMENT SERVICE

Number by Age and Sex

	Male		Female		Total	
Age	No.	%	No.	%	No.	%
15-19	1	25.0	2	50.0	3	37.5
20-24	1	25.0	2	50.0	3	37.5
25-29	1	25.0	-	-	1	12.5
30-34	-	-	-	-	-	-
35-39	1	25.0	-	-	1	12.5
Total:	4	100.0	4	100.0	8	100.0

Six clients in this group were placed. Two were active at the end of the project but will continue to receive placement service. Five of the six employed individuals have worked over six months; three of these over a year. The occupations held by this group are shown in Table 24.

Table 24

OCCUPATIONS OF CLIENTS RECEIVING INTENSIVE PLACEMENT SERVICE
with
Severe Impairment of Lower Extremities
(N=6)

MANAGERIAL (1)		CLERICAL (5)	
Production Manager	1	Secretary	2
		Statistical Typist	1
		Switchboard Operator	1
		Key Punch Operator	1

None of this group is able to use public transportation. The production manager drives his own car. The key punch operator is in a car pool. The others use private transportation. One of the secretaries who pays $25.00 per week for transportation is now receiving driving instruction. We plan to give her a loan for a down payment on a car when she obtains a driving license. She expects to have passengers to share travel expenses.

In this group only the production manager utilized predisability skills.

Placement of Persons with Miscellaneous Disabilities

In Table 25, the clients in this group are presented by age and sex. There are 17, ten men and seven women. They are distributed between the ages of 18 and 59; about half are younger than 40. In this category of "Miscellaneous Disabilities" we do not have the concentration of clients in the 20 to 29 year old group as occur in the other disability categories. Almost half of this group were characterized by long periods of disability and unstable work histories often reflecting psychological problems and poor motivation. Intensive support and counseling was required in many cases. A number of clients left jobs after a short time and some of them ended contact with us. This is in sharp contrast to the "more severe" disability groups previously reported where there was high job stability and a minimum of psychological problems.

Table 25

CLIENTS RECEIVING INTENSIVE PLACEMENT SERVICE
with
Miscellaneous Disabilities
Number by Age and Sex

Age	Male		Female		Total	
	No.	%	No.	%	No.	%
15-19	1	10.0	-	-	1	5.9
20-24	4	40.0	-	-	4	23.6
25-29	-	-	1	14.3	1	5.9
30-34	-	-	1	14.3	1	5.9
35-39	-	-	2	28.6	2	11.7
40-44	3	30.0	-	-	3	17.6
45-49	-	-		-	-	-
50-54	2	20.0	2	28.6	4	23.6
55-59	-	-	1	14.3	1	5.9
Total:	10	100.0	7	100.1	17	100.1

This group's occupations are presented in Table 26. Sixteen of the seventeen clients in the "Miscellaneous" group were placed. As we have indicated, however, a number of these placements were short-lived. Three of five patients with low back syndromes left their jobs. Two lost contact with us. The other went into business for himself. A printer with low back syndrome was placed as a printing instructor and made a successful adjustment. The fifth client with low back pain was a 35 year old woman who had not worked for two years. She had previously worked as a waitress and kitchen worker in institutions and twice had compensable injuries due to lifting while on the job. With a great deal of support she gradually moved into a pre-vocational program, followed by switchboard training and a live-in switchboard job in a girls' residence. After seven months on the job she injured her leg getting off a bus. She continued working and receiving outpatient physical therapy treatment. She complained of increasing back pain and was admitted to a general hospital for treatment. She maintains contact with an Institute counselor and will probably eventually return for service.

A 23 year old cerebral palsied man with scissors gait and involvement of the hands was placed as a histological laboratory technician trainee. He had previously been trained as an autobody and fender man for which he felt he was not suited and he had worked as a taxi dispatcher. He has been on his present job for four months and is making an excellent adjustment. Another 20 year old boy with cerebral palsy with similar symptoms was set up as a self-employed shoe shine attendant in a hospital setting.

A 43 year old man with spastic cerebral palsy, weakness of right arm and inability to perform fine manipulative tasks had been unemployed for several years. He had developed attitudes and fears that interfered with his ability to obtain employment. After more than a year of service, including counseling and participation in the group counseling program, he was placed as a multigraph duplicating machine operator and has now been satisfactorily employed for more than a year.

The secretary and three clerks were stable placements. This group included the following disabilities: muscular weakness of neck and shoulder, with limitations in movement of arms; spinal hematoma; above-the-knee amputation; and a visual defect.

Table 26

OCCUPATIONS OF CLIENTS RECEIVING INTENSIVE PLACEMENT SERVICE
with
Miscellaneous Disabilities

PROFESSIONAL AND TECHNICAL (3)		CLERICAL (6)	
Instructor, Printer	1	Secretary	1
Recreation Worker	1	Clerk	3
Histology Laboratory Assistant	1	Switchboard Operator	1
SALES (1)		Multigraph Operator	1
Salesman	1		
SKILLED (1)		TOTAL	
Engraver trainee	1	Professional & Technical	3
UNSKILLED (3)		Sales	1
Assembler, electrical	1	Clerical	6
Porter	1	Service	2
Truck Driver	1	Skilled	1
SERVICE (2)		Unskilled	3
Pantrygirl	1		16
Shoe Shine Attendant	1		

PART VI. CONCLUSIONS

This project demonstrated a pattern of services based in a comprehensive medically-oriented, rehabilitation center with extensive experience in the rehabilitation of the quadriplegic and of others with severe physical disabilities. An intensive and comprehensive placement program capable of providing individualized and time-consuming services was established in this center. The center's total array of services was readily available to the placement counselor and placement clients.

This report provides evidence of the effectiveness of this pattern of services in achieving vocational placement with a group of quadriplegics and of others severely disabled who were unable to utilize other community rehabilitation resources successfully. The results of this study indicate that the project's pattern of services was responsible for, or an important factor in, the vocational placement of about two-thirds of a group of 82 severely disabled individuals. Of 25 quadriplegics in this group, 23 were placed in gainful employment.

The evaluation and development of the vocational capacities of a quadriplegic generally require the services of a rehabilitation team with specialized training and experience. Quadriplegia, with its catastrophic impact on bodily function, can be overwhelming to both the patient and the rehabilitation counselor. A thorough understanding of the quadriplegic's limitations and potential is essential if the counselor's helplessness and anxiety are to be replaced by the capacity for constructive help. Optimally, comprehensive rehabilitation services should be available at the onset of hospitalization. Deficits in early treatment, counseling, and planning may be responsible for subsequent physical, social, and personal problems that become obstacles in vocational rehabilitation.

The results of the present demonstration project emphasize the importance of specialized, intensive, and time-consuming placement services in increasing the oppottunity for successful vocational rehabilitation of the quadriplegic and others with severe physical disabilities. The evidence indicates that there is a group of quadriplegics and others with severe disabilities and handicapping personal attitudes that can benefit from vocational and placement services provided in a medically-oriented rehabilitation center. The continued interest and assistance of the medical facility provides the support and nurturance that some individuals require to combat discouragement and to maintain hope. In addition, the semi-protected institutional setting is a transitional experience that serves as a bridge to work for those who require it. And finally, the ready availability of a comprehensive array of rehabilitation services in the medical institution facilitates the solving of problems that might otherwise become serious obstacles to employability and placeability.

Three hundred and fifty-five quadriplegics who were patients of the Institute of Physical Medicine and Rehabilitation, New York University Medical Center, between 1948 and 1960 were contacted by a mail survey. Of 177 respondents, 69, or 39 per cent, were employed and 18 were attending college to prepare for employment. Assuming that few of the non-respondents are employed, it is estimated that about 25 per cent of the group of 355 are employed. This survey, the Veterans Administration survey of 1957 (5) and reports from other agencies reveal that quadriplegics are employed in almost every major occupational category, with the largest number in the professional, semi-professional, managerial, clerical and sales fields. A number are in the skilled and semi-skilled occupations (see Tables 1, 13, and 20). These data refute the concept which is still common among rehabilitation personnel that quadriplegics can do very little and that vocational rehabilitation has little to offer this group. (11)

Quadriplegics vary in the extent of physical impairment. Evaluation of vocational potential must be based on a careful individual assessment. For quadriplegia, as for other disabilities, a primary consideration is ability rather than disability. Moreover, an individual's drive, ingenuity, and perseverance can overcome obstacles that may seem insurmountable. The comments of a paraplegic veteran are pertinent: "I had quite a job convincing the VA (to change his vocational objective from accountant to photographer) because they felt my handicap would seriously interfere with such work. They should judge (a person's) spirit and determination and not solely his handicap." (12)

There is increasing evidence of the quadriplegic's ability successfully to complete a course of education after becoming disabled. There is growing acceptance of the severely disabled by colleges and training centers. Such projects as the Rehabilitation Centers at the University of Illinois and Southern Illinois University, the Handicapped Student Program of the University of Missouri, the Woodrow Wilson Rehabilitation Center in Virginia, and Executone's "College by Phone" are examples of the increasing educational and training opportunities for the severely disabled.

Historically, the private, voluntary agency, has pioneered in research and rehabilitation services for many disability groups. With expansion of government-sponsored programs of research, and demonstration projects, private agencies have been given the opportunity to increase their efforts to raise the level of rehabilitation theory, techniques and service. At the present time, it would appear that the private, medically-oriented, comprehensive rehabilitation center should be encouraged to expand research programs and services to the quadriplegic.

Many quadriplegics require a comprehensive and flexible program that seems best administered by a private comprehensive rehabilitation center, with considerable experience in the medical and psychosocial problems characteristic of this severe disability. The present study provides evidence that a comprehensive vocational program for quadriplegics, including an intensive client-centered placement program, can be effectively administered in a medically-oriented rehabilitation center. This report presents evidence that this type of program can result in successful vocational placement for quadriplegics and others who have previously been considered unfeasible for services by other rehabilitation and placement services.

PART VII. RECOMMENDATIONS

1. The present project demonstrated a pattern of rehabilitation services for the quadriplegic and other severely disabled that appears to be effective with a group of individuals who are generally considered unacceptable for service by other agencies. This program of services can be utilized and further evaluated by state rehabilitation agencies and other rehabilitation centers.

2. The survey data presented in this report describing occupational experiences of a group of quadriplegics can be useful to vocational rehabilitation personnel. Information concerning types of occupations, work adjustments, training, transportation, job satisfaction and means of obtaining jobs are presented.

3. The possibility of adapting a wide variety of jobs to the abilities and limitations of the quadriplegic requires further investigation. Can special devices, and modifications in machines, tools and equipment increase job opportunities? What are the implications of automation for the quadriplegic? A program of joint research is indicated, including industry, engineers, orthotists, and vocational rehabilitation personnel.

4. Sheltered workshop facilities for the quadriplegic are extremely limited. Current workshop facilities and tasks are generally inappropriate for this group. The expanded use of workshops for the quadriplegic should receive the attention of investigators.

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